

VIRGINIA WILDLIFE

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Virginia Game Commission Photo by Kesteloo

The right lure a difficult decision

VIRGINIA WILDLIFE

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A Monthly Magazine Dedicated to the Conservation, Restoration, and Wise Use of Virginia's Wildlife and Related Natural Resources, and to the Betterment of Hunting and Fishing in Virginia

COMMONWEALTH OF VIRGINIA



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Cover

Recent studies on the cottontail in Virginia indicate that young rabbits are born in the wild from late February through September, and four litters a year are possible for a single female.

Virginia Game Commission Photo by Kesteloo

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THE SIMPLE PLEASURES

SCARCELY a moment passes these days when we aren't reminded of the growing complexities of modern living and its attendant costs in happiness and peace of mind. Just as frequently, too, we are bombarded by experts on how to meet the situation, advice on how to keep from growing fat or old or neurotic. Volumes of books and countless magazine articles nowadays remind us how to avoid this or that, how to prevent or overcome this disease or that trouble, how to keep from getting cancer, heart trouble, sinus, peptic ulcers, arteriosclerosis (we had to check the spelling on this one), and a hundred and one other ills, not to mention the constant stream of advice from sex experts, psychologists and psychiatrists on how to combat frustration, anxiety, fear.

If we take all this admonition seriously we are bound to become uneasy about the state of our well being, sure enough. Personally, I can't make much sense out of all this free, so-called expert advice and am willing to let well enough alone. Sometimes the more we read about what can happen to us, the more we're inclined to believe there is something really wrong with us. It is possible, and this the experts tell us also, to worry ourselves into a bad state of health.

Recently a friend of mine, a physician, told me that 85 percent of the people in doctors' offices today need no treatment—they just think they're sick. The other 15 percent are really ill and need medical attention. Maybe this figure is high, maybe it isn't. Yet, high or low, it should prove one thing; that frequently we let fear get the best of us, let it make us sick or think we're sick.

Fear is one of the strongest emotions of man; yet, while we're all subject to it in varying degrees, it need not rule our lives to a point of mastery. Fear to a point is good but too much fear, as the late Franklin Delano Roosevelt so often pointed out, can be our undoing.

How do we overcome fear? How do we arrive at a state of mind where anxieties and apprehensions are minimized?

Without going into the psychology of human behavior,

we might say that one way to help overcome fear is to put faith in Divine Providence, in the goodness of mankind, and in the solid belief that man and the universe are indestructible. In a world marked by an ageless past—some 5 billion years geologists tell us—it is little wonder that the average man believes in a hereafter, in the indestructibility of man himself. The physical laws of the universe, and those that govern man, are too wonderful to be just temporary.

Fear too can be softened much these days by training our lives toward a simpler pattern of living by avoiding the hectic, the unusual, the super-thrilling, the artificial and by trying to keep up with the Joneses. It means we could well afford to train our responses to the more simple pleasures of life—the real, the down-to-earth, the natural.

I once met a man who studied fiddler crabs and a more serene and pleasant person there never was. Witness the lives of such men as Henry Thoreau or John Muir or Longfellow. Simple men, living a simple, full life, radiating their humbleness and greatness to all men who would know them. And then there were men like Robert Browning, Teddy Roosevelt, Abe Lincoln, Bob Marshall. For them life held no great fear although each in his time bore the burdens of a difficult life.

Simple pleasures. The world about us is full of them. All we need is to train our responses to the wonderful world of color, sound, smell and sight that is available to us every instant. Ever try hunting for morels in the mountains after a rainy day? Have you ever tried feeling for clams with your toes on a sandy beach at dawn? Ever watch ants at work? Have you ever taken the unbeaten path into some wild country—alone—just to meditate in the presence of great standing trees or fallen giants? I'm sure I speak for all who have experienced such simple pleasures when I say that they are worthwhile and are one means of attaining and maintaining a fuller and better and a more rewarding life.—J. J. S.

MYSELF

*I have to live with myself, and so
I want to be fit for myself to know,
I want to be able, as days go by,
Always to look myself straight in the eye;
I don't want to stand, with the setting sun,
And hate myself for the things I've done.*

*I don't want to keep on a closet shelf,
A lot of secrets about myself,
And fool myself, as I come and go,
Into thinking that nobody else will know
The kind of a man that I really am;
I don't want to dress up myself in sham.*

*I want to go out with my head erect,
I want to deserve all men's respect;
But here in the struggle for fame and self,
I want to be able to like myself.
I don't want to look at myself and know
That I'm bluster and bluff and empty show.*

*I never can hide myself from me;
I see what others may never see;
I know what others may never know;
I never can fool myself, and so,
Whatever happens, I want to be
Self-respecting and conscience free.*

—Edgar A. Guest

RABIES and WILDLIFE

By F. NELSON SWINK, JR.
Virginia Mammal Control Supervisor

IN RECENT years Virginia and all of its neighboring states have been subjected to severe epizootics of rabies. In the past the disease nearly always started in the domestic dog and spread to wildlife populations, but in recent years there are some indications that the disease is transmitted now more frequently from foxes to dogs.

Rabies is a disease that has been known since ancient times. It is world wide in distribution and has been reported in the Arctic as well as in tropical regions. Though rabies has been present in Europe, Asia and Africa for centuries, there is no evidence to indicate that the disease existed in North America prior to colonization. Historical archives from Virginia contain brief references to canine rabies as early as 1753, and those of North Carolina as early as 1762.

Though rabies has been spread and maintained almost entirely in domestic dogs, there have been repeated epizootics in wildlife. Fox rabies was first reported in Massachusetts in 1812, in Alabama in 1890 and in Alaska in 1915. In the early '40's repeated fox rabies epizootics appeared in Alabama, Georgia, Louisiana, Mississippi and North and South Carolina.

Sporadic cases of fox rabies occurred in Arkansas, California, Illinois, Iowa, Indiana, Kansas, Kentucky, Maryland, New York, Pennsylvania, Ohio, Tennessee, Texas, Virginia, West Virginia and Wisconsin during the same time. More recently, many of these same states have had serious and widespread rabies epizootics. In the early '50s New York, Pennsylvania, Tennessee, North Carolina, Georgia, Mississippi, Alabama and Texas have had large areas involved in fox rabies problems.

Epizootics in skunks were reported in Kansas in 1875 and in Arizona in 1907. At the present time skunk rabies is most prevalent in the mid-west and northern plains. Few foxes are reported rabid from this section of the country, even though the population remains relatively

high. Epizootics have occurred in coyotes in Nevada, Oregon and California in 1915, and in New Mexico in 1943.

Contrary to the popular belief that the disease is practically limited to the "dog days" of late summer and early fall, rabies is most commonly reported in mid-winter and early spring. Outbreaks of rabies may develop at any season of the year and in any climate.

One of the most difficult problems of combating rabies is the extremely variable incubation period. This period, the time elapsing from infection to the point at which visible symptoms of the disease appear, can range from three weeks to over two years. This fact serves to point out that the disease is not spectacular in its appearance, for one or two cases showing up can mean the beginning of a slow and long drawn out epizootic, which may take several years to overcome. Some workers in the field have come to think of the average incubation period in wild foxes as being three to five months. If this is true, the number of foxes submitted to the laboratory for diagnosis in January, February, March and April were infected the previous September, October and November. This point is supported by the fact that in the fall of each year the fox population, as well as other wildlife species, is at a maximum for that year. Many young inexperienced animals were breaking family ties and are on their own for the first time. This is probably the period of greatest spread of rabies from one animal to another, particularly foxes.

Rabid wild animals, such as foxes and bobcats, will enter barns, chicken houses, dwellings, pens or any other building, and attack people, dogs and domestic animals in daylight. The disease makes them completely fearless and insensitive to pain; and blows or gunshot will not frighten them. Many reports are received each year of such action in wildlife, particularly foxes. Many people are bitten under such circumstances. In Virginia, 1,650

people in 1954 were treated by private physicians and State Health Department officials and nearly 1,000 in 1955. Undoubtedly infection of cattle and other livestock is most prevalent during these episodes. Annual estimates of livestock losses to rabies in Virginia range from \$250,000 to \$1,000,000 per year. Rabid foxes account for nearly all of the cattle losses reported each year in the state. Individual losses have ranged from 1 to 15 cows.

Many people are unfamiliar with the disease and often ask, what is rabies? Rabies is an acute, specific infection of the nervous system caused by a filterable virus. In a state of nature, the disease is propagated in dogs, and related wild animals, such as foxes, wolves and coyotes. Man and all warm blooded animals are susceptible. The disease is universally fatal once contracted.

The virus is usually present in the saliva of rabid animals during the terminal stages of the disease. It is commonly transmitted from one animal to another by a bite. The virus cannot enter the normal unbroken skin, but may enter the body if infected saliva gets into a fresh wound.

The following table shows the total number of cases reported as diagnosed positive by State Laboratories and number of fox cases reported in Virginia 1938-1955:

Date	All Animals	Foxes	Date	All Animals	Foxes
1938	55	0	1947	162	4
1939	66	0	1948	158	1
1940	97	0	1949	82	2
1941	51	0	1950	94	1
1942	89	0	1951	223	63
1943	277	0	1952	476	164
1944	334	0	1953	461	107
1945	113	2	1954	377	181
1946	108	3	1955	381	201

Each year since 1951 the significance of wildlife rabies has become increasingly more important. Last year, 1955, was the first time that wildlife rabies cases outnumbered dog rabies cases, when it was reported at nearly twice the rate as was dog rabies.

In Virginia, wildlife rabies is primarily a fox rabies problem, although several other species have been diagnosed positively by the state laboratories. Included are bobcats, raccoons, deer, woodchucks and skunks.

It is frequently said that only the grey fox can transmit rabies. Nothing could be further from the truth. In the reporting that is obtained, the preponderance of fox cases are grey foxes, but this is only true because the total fox population is composed of approximately 20 grey foxes to 1 red fox. In some places the ratio is higher, and in other places somewhat lower. It is well to remember that we are more likely to see red foxes because of their preference for more or less open land, while grey foxes tend to inhabit the brushy and more heavily timbered land, thus having the opportunity of concealing themselves more easily. Many people tend to believe that the fox population is low just because you don't see foxes very often. However, experience has shown that a large fox population can exist in a given area, and relatively little be known about its presence.

In all probability the fox population is on the decline over most of the state, dropping from the high that existed from 1951 through 1954. Many reports from all over the state indicate this downward trend, particularly among the red foxes, but information about grey foxes is insufficient to indicate a true picture of the population.

The question often asked is: Why do we have so much fox rabies now? Why haven't we had it all along? The principal reason is the lack of demand for the long-haired furs and the subsequent lack of interest in trapping. This would apply to foxes in particular. At this writing, the average price that a fox pelt will bring can justify neither the time nor the effort it takes the trapper to prepare the pelt for sale. As a result, the pressure put on the fox population by fur trappers is relatively light and the foxes are free to multiply at a rapid pace.

The fox population was permitted to increase for nearly a decade, 1945 to 1952, practically unmolested; the result being that we had a large population that was



In Virginia, wildlife rabies is primarily a fox rabies problem; however, all warm-blooded animals are susceptible.



Rabies is one method in which nature reduces a portion of an over-population of animals, whether bobcats or other wild animals.

just right for an epizootic disease to enter and spread. And much to our sorrow, that epizootic is rabies.

The disease appeared in northern Virginia and in southeast Virginia at nearly the same time. Dog rabies was present in southwest Virginia at the time and it seemed only natural the infection would flow over into the fox population, since very little dog rabies was found in northern Virginia, and it is not known how the fox population became cast in the role of a carrier.

Generally speaking, wildlife rabies is widespread throughout the western half of Virginia, chiefly in the area west of the Blue Ridge Mountains. However, several large epizootics have been centered east of the mountains, notably in Loudoun, Fairfax and Fauquier Counties. In the past year, severe outbreaks have occurred in Botetourt, Highland, Alleghany, Bath, Grayson, Smyth, Shenandoah and Page Counties, with nearly every county west of the mountains reporting some cases.

Reporting is the weakest link in the whole chain of information concerning rabies. It is now estimated that 5% or less of the total infected animal populations are ever submitted to the laboratory for examination.

It is not uncommon to see one or two cases suddenly appear in a county where the disease has not been reported for a considerable period of time. These may be followed by a sizable outbreak. Frequently, however, several months or more may elapse without further cases being reported. This does not necessarily mean that the disease is no longer present. It merely remains submerged in a small number of individual wildlife species and terminal cases do not come in contact with humans. This has undoubtedly been the case in a number of Virginia counties.

Fox rabies, such as we are experiencing in Virginia at the present time, can offer special problems which make the job of suppression even more difficult to understand and handle.

Fox rabies presents a serious problem in the eradication of rabies in dogs. If a reservoir of infection is maintained in foxes, outbreaks can be expected whenever the density of the fox population and other factors are favorable. Thus, any relaxation in the antirabies control program in dogs could mean reintroduction of rabies



Control measures have varied from county to county in areas where rabies outbreaks occur. A good trapping program is sometimes effective on a local basis.

into the dog population from rabid foxes.

Rabies is one way in which nature reduces a portion of an overpopulation of animals. As pointed out before, the incubation period of rabies is so long and variable that it eliminates the animal population at such a slow rate that annual reduction is unnoticeable. Often the female fox will produce a litter of pups before she falls victim of the disease. Over a long period of time, for example, ten to fifteen years, rabies can be expected to make serious inroads in a wildlife population, but in the meantime hundreds of thousands of dollars' worth of livestock are lost, domestic animals are victims, not to mention the mental anguish and suffering of hundreds of people exposed to the disease.

Dr. Mark I. Shanholtz, Virginia State Health Commissioner, wrote in 1952: "Rabies can be eradicated completely in the next few years if control measures are taken now." Control measures have varied from county to county and the success of these control measures has naturally varied a great deal. The major control measure is through local legislation, planned and enforced by local officials. Assistance with planning and operation of control methods is available through the Virginia Commission of Game and Inland Fisheries, Virginia Department of Agriculture and Immigration, the Virginia State Health Department and U. S. Fish and Wildlife Service. A well defined program has been designed and proven highly successful, if public cooperation throughout the duration of an organized program remains high.

"People need to understand that man is a part of the natural world in which are many valuable materials that he has learned to utilize for human sustenance and for human betterment. These materials, or resources, are not man made. They are the result of natural processes. They include soil and water, fish and wildlife, forests, grass and minerals as well as human society. Man's economic, social and political welfare is largely dependent upon the manner and extent to which he utilizes and manages his natural wealth."—*Conservation Handbook*



"The Time of the Singing of Birds"

By DR. J. J. MURRAY
Editor, *The Raven*

THIS title is taken from a lovely spring poem in an ancient book in our Bible, which we call the Song of Solomon, but which might better be named the Song of Songs, for Solomon's connection with the poems is only slight. The book is an anthology of love songs and marriage pieces. As always when love glows in the heart, common speech will not suffice, but the feeling must flame forth into poetry. And such poetry is apt to be bright with the symbolism of nature.

"For, lo, the winter is past,

The rain is over and gone;

The flowers appear on the earth;

the time of the singing of birds is come,

and the voice of the turtledove is heard in our land;

The fig tree putteth forth her green figs.

and the vines with the tender grape give a good smell.

Arise, my love, my fair one,

and come away." (Song of Solomon 2:11-13)

When springtime reaches Virginia, "the time of the singing of birds is come." Then every bird experiences the most exciting days of its year. The most vivid expression of that excitement is song. The cardinal whistles, "pretty girl, pretty girl." The yellow warbler is saying to its mate, "sweet, sweet, sweet, sweeter than the sweet." Every hedgerow knows its song sparrow lilt. And even the miserable starling tries to intersperse in his groans and shrieks the note of a bobwhite or a pewee.

In all the range of animal life there are only two groups that in any real or complete sense have the ability to sing—birds and human beings.

Insects, to be sure, make music, but they are all instrumentalists. The grasshopper makes a fiddle of his wing, with a hind leg for a bow. The cicada beats a tiny, high-

pitched snare drum, using the chitinous membrane over an opening in his back, with muscles to make it vibrate rapidly. Beetles and flies make a not-unmusical humming sound with their wings, and we are all too familiar with the frenetic whine of the mosquito. Birds share in this mechanical type of music also, as when the flicker disports himself on a tin roof in April.

Amphibians, too, make music of a sort, although rather like the duller effects of the oboe or the bassoon in the woodwind section of the orchestra. They were probably the first vertebrates to develop such notes. The Cornell University record of night noises shows a surprising variety in the spring notes of the batrachians. But this can scarcely be called song.

Mammals also have their music, attractive no doubt to their own kind, as far from singing as it may seem to us. It ranges from the squeak of a little white-footed mouse to the lordly roar of a lion, or the bellow of a buffalo, or the wild neighing of a stallion.

Only birds, however, of wild nature's children, really sing. Not all birds, to be sure, have this ability. Many of them have little or no voice—pelicans, cormorants, many other sea birds, vultures. And among those that sing the notes run through an extraordinary gamut of the pleasing and the unattractive. As Dr. Alfred Newton, author of *A Dictionary of Birds*, says, "It seems impossible to draw any but an arbitrary line between the deep booming of the emeu, the harsh cry of the guillemot, . . . the plaintive cry of the lapwing, the melodious whistle of the widgeon, 'the cock's shrill clarion,' the cuckoo's 'wandering voice,' the scream of the eagle, the hoot of the owl, the whip-cracking of the manakin, the chaffinch's joyous burst, or the hoarse croak of the raven."

As a general rule, the higher the bird stands in the scale of evolution, the more developed are its vocal powers. This indicates that song in the true sense is a late development in birds. For millions of years there was none. I would not like to have lived in Jurassic or Cretaceous times, or even in the Miocene or Pliocene, when birds made no music. It would have been as dull a world as Keats described, when

"the sedge is wither'd from the lake
And no birds sing."

Sometimes we speak of the "whistle" of a cardinal or of a bobwhite, but this is only poetic. The notes of birds are never whistled, but are truly sung. The mouth is wide open when a bird sings, its only part being to let the sound out. But the voice box of the bird is quite different from that of a human being. With us the voice box is the larynx, at the upper end of the windpipe, and sound is produced by the vibration of the vocal cords stretched on the cartilage of the larynx. A bird has a larynx, but it is voiceless. With a bird the voice box, called the syrinx, is located at the lower end of the windpipe, where the bronchial tubes branch off to the lungs. The complexity of its anatomy varies greatly, from the simple type in the ostrich to the highly modified type in many of the song birds, although there is no direct correlation between the complexity of the syrinx and the intricacy of the song.

The voice box of a bird consists essentially of vibrating membranes stretched across the bony framework of the lower windpipe—often including also the upper parts of the bronchial tubes—and a set of muscles, varying in number in different species, which change the tension of the membranes and even in some species move the windpipe as a whole. The song is produced by the outgoing breath moving rapidly over these membranes. So complicated is the mechanism of membranes and muscles that the bird can get in many more notes to the second than can any human singer.

In nearly all species of birds it is the male alone who performs. There are exceptions. All of us, I am sure, have heard the female cardinal sing, but her song is slighter and quieter and much less frequently given. It is indeed a rather private performance. The female rose-breasted grosbeak will occasionally sing a feeble song. Such cases are the exception rather than the rule.

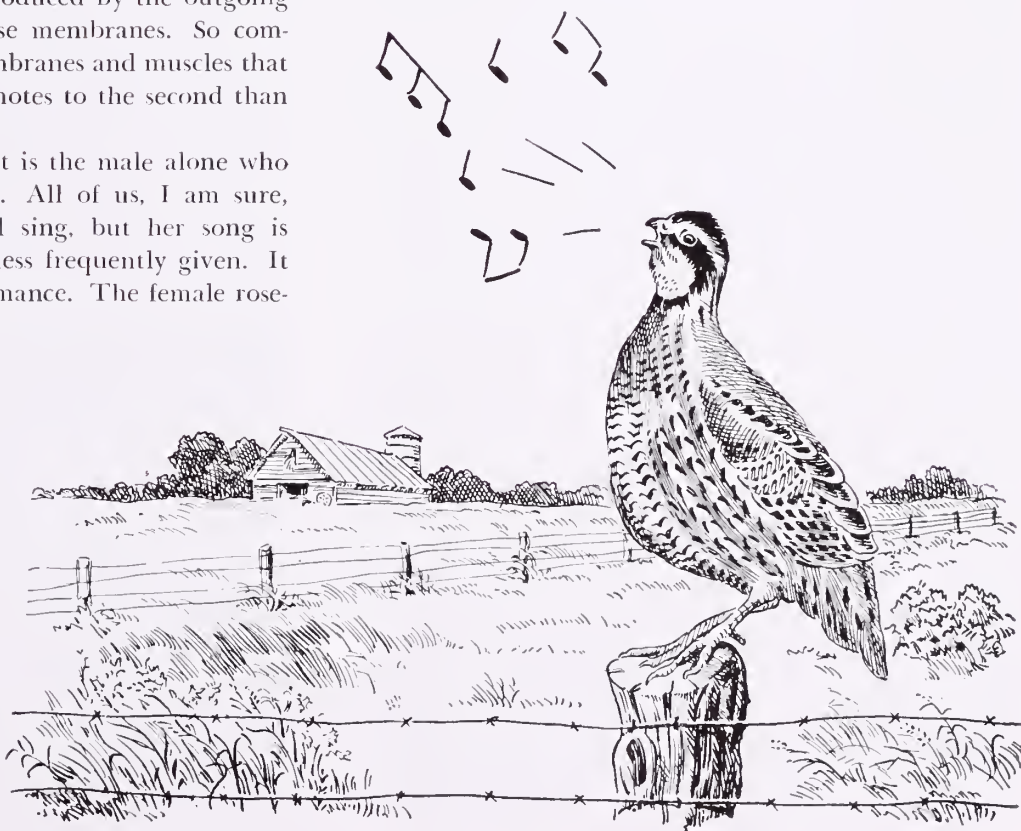
Bird song is definitely connected with the mating process, and hence is considered by biologists to be a secondary sexual characteristic. Because of this there is much less song in late summer, autumn, and winter than in spring and early summer. Most birds do not sing at all in winter, and many do not sing in fall. The cardinal, which has a much

longer-than-average song period, does not sing much until after the first of the year and usually even then only on bright days, for he is a sun worshipper. The full song rarely begins until March, or at the earliest in late February. My children used to say that one of the best of his many songs was "pretty girl, pretty girl," but they learned that this version did not come until the sun had warmed his throat as well as the earth beneath him. Until then his song is a series of short notes or a double note, "hreeeter, hreeeter."

One of the many attractive qualities of the song sparrow is that he will sing at all times of the year and in any kind of weather. The same is true in somewhat lesser measure of the Carolina wren. On very warm days in winter, particularly late in the season, some of the northern birds, such as the hermit thrush or slate-colored junco or fox sparrow, will do a little singing but the singing then is a pale comparison with the performance on the breeding grounds. The white-throated sparrow is a better winter performer, his sweet threnody being heard on any good day.

In late summer, when nesting is finished and when the time for the molt is at hand, there is a letup in singing. Many of the warblers cease entirely. For some species there is a resumption of song in early fall.

Even during the breeding season birds do not sing all day long. It is mainly in the cool of the morning that song sounds forth, with a lesser renewal after the middle of the afternoon. With a few species the hour before twilight is the chosen time. Even in the morning, song comes in waves, with stops for feeding. Shortly after day-



break comes a period of heavy singing. Then, after sunrise, there will be brisk and slack periods alternating. Sometimes these periods of active and inactive singing seem to be synchronous for many species.

An interesting kind of bird song is what Herbert Ravenel Sass in his delightful book, *Adventures in Green Places*, calls "fairy music" when, as he says, the bird is singing "under its breath." I like to think of this as a "whisper song." The bird seems to be indulging in a musical meditation singing only for itself. Such music cannot be heard more than a few yards away. It also has a ventriloquial quality, not characteristic of the bird's ordinary song, which makes it difficult to locate the singer unless he is in plain view. In another place I have referred to some instances of this kind of avian music. One May day, as I sat at my desk early in the morning I heard, to my amazement, a veery's song from under my study window. It was faint; it lacked the resonance of the full mating song; but it had the unmistakable quality of that song, always before associated in my mind with high and lonely places. In keeping notes for many years on this "whisper song" I have heard it from at least a dozen species—blue jay, which raucous bird has some low and lovely songs; house wren; winter wren; mockingbird; catbird; veery; ruby-crowned kinglet; yellow-throated vireo; chestnut-sided warbler; female cardinal; towhee; and song sparrow.

Singing at night is another interesting manifestation of bird song. Mockingbirds are given to nocturnal concerts, especially when the moon is bright. If one brushes against a cedar bush in which a field sparrow is roosting, the bird's reaction is often a bit of song. The same is true of the cardinal. I have often heard at night across the meadows a killdeer's song, and less often the note of the yellow-billed cuckoo or of the wood pewee.

The yellow-breasted chat is a brilliant night singer. I remember a dark May night when I was staying at our cabin near the Maury River. As the bed was not too comfortable, I slept somewhat fitfully. Every time I awoke—it being possibly the occasion of my waking—a chat was singing in the thicket near the back door. It was not like the sleepy song of a startled field sparrow, but the full effect, loud and with all the queer sounds which this bird affects. On one of these occasions, at 2:45 by my watch, I also heard a faint note from a pewee and a louder call from a distant yellow-billed cuckoo.

The male rose-breasted grosbeak has an accomplishment, which is almost unique, of singing while on the nest. At least one reason for the fact that with birds the female is often duller than the male is the need by the female of the protection of this obscure coloring during incubation and the care of the nestlings. Males of the brighter species are more apt to leave the care of the young to the female. But a startling exception is to be found in the case of this brilliantly colored male rose-breasted grosbeak. I have watched the bird actually singing as he sat on the eggs, as if willing blatantly to call attention to himself by color and by music at this critical time. This seems to pose a problem rather difficult of

explanation on any theory of natural selection.

Coming back to the main purpose of song in the breeding period, it seems quite clear that song is chiefly utilitarian. The little yellow warbler that flies about a fairly definite area in your yard, with a number of singing posts which he frequents, seems to sing for two purposes.

The first purpose of song is the establishment and maintenance of a territory. One of the major discoveries of modern ornithology is the fact that in most species each pair of birds has a definite territory which they claim and which they will hotly defend against all other birds of the same species. The value of such a territory is that it ensures a sufficient food supply for the young. Since the chief competitors for the special food desired by the species are other birds of the same species, the pair will fight their own kind, while generally tolerating birds of other and presumably less competitive species.

This territory is well marked out. In order to stake his claim and to warn other birds from his territory the male has a set of regular singing stations about the area, which he visits in turn. He does this to establish in the beginning his right to the territory and then to maintain that right and to warn off neighboring males who try to squeeze in on him and to enlarge their territories at his expense. The first purpose, then, of song is to post the bird's home area. In order to make his song warning stick he has to be ready to back it up with bill and claws.

The second purpose, recognized by all bird students, is the attraction of a female to the nesting territory. After the territory is established, or while it is in the process of being established, the male yellow warbler sings at the top of his voice to let passing females know that here an eligible bachelor with a good estate is ready for a sweetheart, helpmeet, and homemaker.

There is, I think, a third reason for which birds sing. It is probable that birds sing not only for the utilitarian reasons mentioned but also just for the love of it, out of a *joie de vivre*. The hard and fast scientist, who tends to be a mechanist, might deny or minimize this aspect of song. At most he would say that, apart from its utilitarian aspect, song is only the outlet for the physiological condition in which the bird finds himself at the breeding season. It is that, of course. Dr. Frank Chapman, who would not at all limit song to its purely utilitarian phases, describes it as "a secondary sexual characteristic, an irrepressible manifestation of the greatly increased vitality of the bird during the period of reproduction." It is then that the bird's vigor is most intense. He is like an adolescent boy whose energy simply cannot be used up in commonplace activities, who must run and jump and yell. However, if song is purely utilitarian, it is not easy to explain fall and winter song. Most of a bird's activities can undoubtedly be explained mechanistically. Nevertheless a bird is something more than a machine, and we should be slow to deny him a sense of pleasure in his singing. It is not unlikely that there is in him a primitive kind of aestheticism, by which a bird enjoys, not in a human but in some dim avian way, the music that he makes.



Virginia Game Commission Photo by Kesteloo

Better stocking techniques and better fish distribution is one tool that will improve trout fishing and eliminate the opening day rush.

How Virginia Can Have Better Trout Fishing

By T. D. WATKINS
Commissioner, Third District

IN THE two previous articles appearing in *VIRGINIA WILDLIFE*, I briefly discussed some highlights of Virginia's trout program and urged that trout fishermen take a sober look at the facts and see who was paying for what in our "put and take" trout fishing. Now I'd like to discuss just how Virginia can enjoy better trout fishing and how we can put more sense into the whole program.

This is not to say, of course, that I or the Commission know all of the answers. I'm merely pointing out some facts which need to be looked at very realistically, and indicating some avenues of approach toward a better situation.

Certainly, Virginia trout fishermen who went out opening day—some 100,000 fishermen on 150 trout streams—will readily agree that something should be done and that the time to begin is now. Conditions have changed so drastically in recent years and with the tremendous increase in fishing pressure that has developed, new approaches to a better type of trout program are absolutely necessary.

We could throw up our hands after each opening day and say "What's the use, why bother? Nothing can be done to improve the situation." But that is the pessi-

mistic attitude and is not realistic. The Commission feels that something *can very definitely* be done to bring the facts of Virginia's trout program before the public and get the masses of interested trout fishermen sold on any reasonably good new program.

How can Virginia's trout program be improved? What things need exploration, and what concrete suggestions might be offered Virginia trout fishermen to get us out of our present dilemma?

I have four major recommendations to offer as to what can definitely be done. *First*, I think all who trout fish must sooner or later come to the realization that the program *must begin paying for itself in some way*. From the facts in previous articles, it is obvious that at 50c per fish the trout fisherman is not paying his way. While, perhaps, trout fishermen individually will never be able to completely pay the full costs of the trout they catch, it should be possible to have trout fishermen collectively pay for the program. In other words, in a highly artificial put and take program such as we have in Virginia, *only those who want to trout fish should be taxed for such a program*. Other anglers who never trout fish should not be required to pay for the trout load.

Under the present Commission license system, it is very

difficult to determine just how many of those fishing are trout fishermen. A possible solution to this situation is a separate trout license. In looking over the states in the southeastern region that have trout fishing of any consequence, Virginia is the only state that does not have a separate trout license. Separate trout licenses are in effect in Tennessee, in North Carolina, and in Georgia, not to mention a host of other states throughout the country. It must be emphasized again that conditions today are rapidly changing and we cannot meet those changing conditions with a static situation. Virginia fishermen are increasing at a rate of somewhere between three and six percent a year and trout fishing, particularly the opening-day kind, seems to be on the steady increase. Something must be done to meet such a condition.

Second, our biologists are of the firm opinion that a great deal can be done to effect improvement in our trout program by better stocking techniques and better fish distribution. Such improvements can be put into effect immediately if the necessary policies are adopted and personnel provided. Such things as stocking fish in closed pools, stocking several times during the season, and better distribution of fish are only some of the things that can be done right away to improve the trout program. A survey to determine the specific type of management to which each stream is suited is a necessity. These improvements are possible with public support but they will not be done easily. In any program of game or fish management, the Commission can move no faster than what the general public will allow. The Commission's recent experiments in the sectional stocking method have proved that this is one desirable approach to some streams. It will not work, of course, in all cases but it can be made to work in a great many.

Third, a great deal can be done to improve trout waters themselves, not only for the fish but also for the fisherman. At the present time there are great stretches of waters that harbor few fish because they do not afford the best living conditions for trout. With additional revenue by a self-supporting trout program, it might be desirable to begin habitat improvement work on some trout streams. It should be pointed out, however, that trout stream improvement alone will not provide the sole answer to better trout fishing. Some streams can definitely be improved, others cannot. In many cases trout stream improvement work might have to be done on a continuing basis, pretty much like a farmer taking care of his land. To keep a farm in shape, it must be looked after

continuously. The same goes for trout streams. If we want them in the best of condition, we've got to give them some care and maintenance. When trout waters become improved, they will hold more fish per mile, will carry longer, and will give fishermen more sport.

And *lastly*, we must accept a new basic premise in our trout fishing program. We must answer the question, what are we trying to achieve? Are we trying to provide sport, or, are we trying to provide meat? Obviously the aim is maximum sport for as many people as possible. If this is so, then we must understand that we can't have our cake and eat it too. We can't catch all of our trout on opening day and still have them for fishing fun later in the season. We can't keep taking eight trout a day, the creel limit, at 50¢ apiece, and hope to stay in the black. With increasing fishing pressure, it may be necessary to cut down the daily creel limit. After all, if it's not a meat proposition, what's the difference; why have a creel limit of eight fish a day? To emphasize the sporting angle, we may have to set aside more and more streams for artificial lures only, where the anglers can get far more sport per fish. It may even be desirable in some instances to set aside streams under a novel set-up such as the *Hazard* plan, where fishermen can catch all the fish they want but are not permitted to keep any. This would be a very radical approach but on a few trout streams it might prove a good experiment.

It is also possible that in many sections of the state trout streams not being fished heavily today can be brought into greater use. Our biologists say that Virginia has many trout streams—good native waters which contain fair populations of native fish but which are not being fished adequately. This would mean that additional publicity and promotion should be directed toward getting fishermen acquainted with all of the waters of the state, not just a few of the more popular ones.

Finally, and this is one thing every trout fisherman should understand, we should remember that once a fish is in the creel and is dead, it is no longer capable of giving any further sport. That fish is gone, sportwise.

There is no one final answer to better trout fishing but if we can take the emphasis away from the meat angle and put it on the sporting angle, and, the closer we approach the "no creel" goal in our trout fishing, the better will be the quality of our state's waters.

Virginia's trout fishing program can be improved and the Commission stands ready and willing to cooperate with the sportsmen of the state, armed with the facts uncovered by trained fish biologists, to put a better program into effect.

"Virginia is most fortunate in the variety of her natural resources and the extent to which they are available. These resources have contributed in great measure to the economic and cultural growth of the State. The continued progress and well-being of her citizens, however, are dependent upon the wise use of these resources. A broader knowledge and appreciation of the soil, water, plants, animals and minerals within the State and their relationship to the welfare of the people is basic to a citizenry which does not exploit its natural wealth."—DOWELL J. HOWARD, Superintendent of Public Instruction. Foreword, *A Look at Virginia's Natural Resources*.

THEY'RE YOUR KIDS, MISTER!

By C. B. LISTER*

School is out! There go the kids!

Where are they going? What are they going to get into before the school bell rings again? A few of the luckier ones will go into summer camps, into the congested but wholesome activities of some Boys' Club, or will take up their share of the work load on the farm.

Most of them are going into the city streets, out to the city dumps, off into the suburban wood lots and fields.

Some of them, giving vent to normal, healthy, animal spirits, unguided by sympathetic adult experience, will drown in forbidden swimming holes. Some will rush under the crushing wheels of modern traffic. Some, seeking the acclaim of their mates, will transgress the grown-ups' rules of propriety and will join the list of juvenile "delinquents." Some will venture, untrained, unwarned, to play with forbidden weapons. There will be accidental shootings. And for every such incident there will be a community reaction against the sale and use of firearms.

What are you going to do about it, Mister? These kids, you know, are the America of tomorrow. You may be childless but you have got to live with these youngsters and their parents — not only tomorrow but today. Do you want to lie, sleepless, looking into the black night at the drawn, parchment-white features of a kid who ran under your car in the traffic stream? Don't you want to spend your old age in a nation governed by clear-headed, straight-thinking, courageous younger men?

You can't safely pass the buck, Mister. Maybe you can't contribute much to the local Boys' Club. Maybe you can't serve as a Scout Master. But two things you *can do*. As a *citizen* you can demand of your city fathers that they furnish more off-the-street play areas and supervised junior recreation programs. As a *sportsman* you can take *one* kid into your gun room and give him the greatest thrill of his young life while you tell him the story of your guns, how they work and how the real sportsman always handles firearms safely, sanely, and expertly. You can take *one* kid out to the range into some safe spot in the woods or fields and teach him how to shoot. You can prod your local sportsmen's club into instituting a real junior program of instruction in shooting, conservation, sportsmanship, that will contribute mightily to the reduction in traffic accidents, shooting accidents, swimming accidents and "juvenile delinquency." Perhaps you can even awaken your community to a knowledge of the fact that the very term "juvenile delinquency" is a phrase coined by adults to cover up their *own* delinquency in neglecting the youngsters they have brought into the world!

School's out. The kids are spreading out everywhere. They are getting into everything. If they get into trouble it's *your* fault, Mister!

*Late Executive Director of National Rifle Association and Editor of the *American Rifleman*.

WHY GAME LAW VIOLATIONS?

By FRED WESTON*

Any report of a game law violation always disturbs a sportsman not only because of the does, fawns, and turkey poult that are killed but also because of the philosophy that warps the minds of otherwise law-abiding citizens and lets them violate a game law with no strain on their consciences. This fact should also alarm all citizens of this state, but it doesn't. Here is why, and what can be done about it.

Strangely enough, the average citizen is reluctant to cooperate with enforcement agencies to bring to trial violators of game laws. On the other hand, that same citizen will risk his life to capture a thief seen entering the house next door. Likewise, he will lose no time in tipping off peace officers when he knows of some other infringement of the law.

That spirit of cooperation, however, does not extend to game law violations which, for some unknown reason, are not considered real infringements of the law. Yet the laws governing our wildlife are made by the same agencies that make our other laws. A game law violator often uses this peculiar kind of logic to justify his actions.

The landowner who disregards the hunting season says he feeds the game and is therefore entitled to take what he wants when he wants it. Others say they are just getting their fair share from the landowner or the rich man who has leased hunting rights. Then there are others who violate the law for spite, or because they think it is amusing to outsmart the game warden. Regardless of why they violate game laws, they are cheating the law-abiding sportsman as well as the youngster next door.

It is this philosophy on the part of the citizen and the game law violator with which we should be concerned. Laws in our democratic state are made for all to obey and enforce. They are not selective. They are not made for or against any individual or group of individuals. Killing deer out of season is just as much a violation of a law as is burglary, for all laws are adopted in the interest of protecting the rights of all citizens. The citizen is just as much responsible in protecting his rights, to demand compliance by others as well as himself.

*Vice-President, Texas Wildlife Federation.

"Natural resources, like certain of our minerals and fuels, are limited and can never be replaced once they have been used. Others, like soils, forests, and wildlife, if adequately managed, can provide essential sustenance for present populations with the confident expectation that future generations will not suffer because of current use."—*Conservation Handbook*



Boat liveryes and launching sites in the Back Bay area are ample. So is bait and guide service. Write to the Commission for the leaflet on Back Bay, or see local wardens for information.



Back Bay, only 12 miles from Virginia Beach, is separated from the ocean by a series of ponds, nooks, gulfs and bays.



Enterprising anglers can strike off on their own and fish from the bank or wade, as this fisherman is doing on Knott's Island.

BACK BAY—Bass

No place in Virginia does the bass fisherman find better fishing. Acres of open water, creeks and ponds, small marshes and bays. Biologists say no water in Virginia can compare to this.

Big, extensive, with plenty of boat and bait facilities. One amazing thing about the place is that it is seriously under present fishing pressure and, instead of deteriorating, the area is a try the next time you're thinking of going after bass.



New facilities for fishermen are constantly being added to in the Back Bay area. This is a new place going up in the North Bay area.



Fishing methods are many. Poling a boat backwards along reedy shores is popular with some guides.



beach called False Cape (right) and contains a vast assemblage of marshes, make for ideal bass fishing.

sherman's Eldorado

water than in the sprawling Back Bay — some 25,000
ys that yield bigmouth black bass in unbelievable num-
productivity.

ck Bay is truly an answer to any fisherman's prayer. The
ned. Experts believe Back Bay can stand 25 times the
ning should get even better! Why not give this fabulous
pass? You'll love the place and the fishing.



Boats run from one to two dollars a day, and guides ten dollars a day. In the beginning it is always wise to employ a guide so that the territory can be learned.



Aerial view of one of many boat docks in the Back Bay area. Minnows run 25 to 35 cents a dozen.



Area around the Commission's Back Bay headquarters is a popular gathering spot for fishermen. Wardens are glad to render information.



July and August are good fly fishing months. With big bass, flies and bugs and bucktails are popular and productive.



Commissioner Thomas G. Herring presents the Ninth Annual Wildlife Essay Contest winner, Raiph K. Steckler, with a \$400 college scholarship.

WHAT I CAN DO TO HELP WILDLIFE IN VIRGINIA

By RALPH K. STECKLER

(Editor's Note: This is the essay which won the \$400 college scholarship of the Ninth Annual Wildlife Essay Contest, sponsored jointly by the Virginia Commission of Game and Inland Fisheries and the Virginia Division of the Izaak Walton League.)

IN OUR early history, during the primitive period, man knew very little about wildlife. Primitive man was more or less forced to encounter wild animals. He killed many animals for food and left others to be eaten by parasitical animals. However, until he had learned ways of successful hunting and fishing, he did not use animals much for food and clothing. Then, when those skills had been acquired, his only responsibilities were to provide skins for clothing and flesh for food. As time went on, however, birds and other game were shot and fish were caught simply for pleasure and at all seasons of the year.

In our modern times we have many responsibilities, but none so important as the protection and preservation of our soil, water, forests, wildlife, and other renewable natural resources. "Their wise use, or conservation, consists not so much in limiting use," writes John D. Black in his book, *Biological Conservation*, "as in making certain that the use is wise and that the harvest does not exceed the capacity of the environment to renew or replace that resource which is used."

There is such a close relationship between wildlife and its surroundings that it is impossible to disunite one completely from the other. Plants need soil in order to grow. Animals need plants for food and shelter. Many of the essential requirements of plants and animals are acquired from water. Life without water is impossible.

For protection and preservation of our resources, we have many laws and suggestive posters, besides all of the bulletins and magazines published for this purpose. We have the responsibility of knowing these laws and helping to see that they are enforced to the fullest extent. There are some public officials appointed on political basis, who are connected with wildlife and land management who are incapable of performing their duties properly because of lack of know-how. These kinds of people are the ones we must fight against.

We, as citizens of the United States, can also make it our duty to broaden and enrich our knowledge of our natural resources so as to save and protect them. We could also undertake some conservation project, such as the planting of trees, the studying of forest fire prevention, and many others.

I, as a member of the 4-H Club and FFA Organization, can take part in improvement practices by rotation of crops and the planting of trees on hilly unused land in order to prevent erosion. As Ruth A. Dodge writes in her book, *Elements of Biology*, "Erosion has already severely damaged about 280 million acres of the crop and grazing land of the United States. Only 160 million acres of good land suitable for crops are left. . . . Unless we take action now to prevent further loss of soil, we shall continue to lose a half million acres a year."

Soil is a basic essential to life on the earth. The word, soil, has different meanings to different people. To some it means fragmented rock. To the farmer it means livelihood, and to others it means just dirt. Except for water, soil is the most important substance on earth. From the soil we get everything we eat and wear. The early peoples left this resource in a critical condition. We have had to study soil and its properties constantly to find the lacking properties which may make it less fertile and productive. We also have to find substances to put back into the soil when there is a deficiency.

The richer we can make our soils, the better crops we can grow and the healthier our animals will be. Land, which is too poor for our cultivated crops, may have vegetation established and maintained as a permanent cover. In order to make life possible, there must be a gaseous balance between the oxygen and carbon dioxide of the air. If we are to have an adequate supply of these, we must have vegetation. This supply is acquired through the interaction of plants and animals. We can plant trees and other crops on unused land to prevent soil erosion and to provide food and shelter for wildlife.

Studies made by wildlife managers prove that there is a fundamental value of the management of land pertaining to the welfare of wildlife. The conclusion, according to Edward H. Graham in his book *The Land and Wildlife*, was that ". . . we must look to the treatment of the land if the species is to survive and increase."

We have to be careful with our lakes, streams, rivers, etc., which provide water for some animals and serve as habitat for others. Grasses and other vegetation should form a cover so as to keep the ponds, streams, lakes, and rivers from filling up with silt and mud. Silt and mud can wash into water and ruin the fish vegetation by covering it up and starving some of them. It also covers up fish eggs. In many cases where men depend upon fishing as an income this would cause loss of livelihood. So, by spreading conservation information, we not only help ourselves but our national security as well. Good management projects are worth the price and effort they cost the farmer. Life originated in the water, and without water nothing can survive. We must protect our water from being polluted by soil.

In addition to pollution from soil, there is pollution from concentration of human life, and industrial pollution from such things as oil wells and other projects which give wealth.

There have been many changes made by man down

through the years. Ira N. Gabrielson in his book, *Wildlife Conservation*, writes: "The forests, themselves an important water conservation and distribution agency, were soon cut down by man. The prairies and plains were plowed and marshes were drained to produce, in some cases, good agricultural ground and, in others, land of little or no value. The entire agricultural effort was devoted to clearing land and to hastening the flow of water from it, by draining marsh and water areas, digging open trenches and putting in thousands of miles of tile drains. Streams were straightened and deepened until many of them run through narrow straight ditches. Under original conditions the meandering streams held back the flow and helped to maintain water in the soil well toward its normal carrying capacity."

Large quantities of accumulated water should be stored where it falls on the land. To the farmer, this means improving farming methods to prevent erosion, better methods of using excess water, and revegetation of hills and steep slopes. Lakes and swampy places, which have been filled in, should be reopened so as to act as reservoirs for local use and as a means of flood control.

All bodies of water will produce vegetation and food for fishes and other wildlife. Thus, we can say that water conservation is a field as broad as soil conservation. As John D. Black has written, "All land—with the water which nourishes it—is wildlife land. All soil and water conservation, when properly planned and carried out on the land, is wildlife conservation."

The forest lands of this country have been terribly destroyed. Because a large part of the continent was covered with forests, the first settlers had to cut down and burn the trees. Later, when a great deal of lumber was needed for building homes, for railroads, and for factories, the lumbermen continued these wasteful practices of the colonists. If the lumbermen had cut only what they needed, we should still have plenty of timber. Only a part of what they cut was used, young trees were destroyed, and many good logs were left to rot on the ground. Even today we waste wood and its products. While lumbermen are working, they kill the young trees that would mean lumber in another century.

The forest lands of the United States serve as a habitat for many of our animals, such as deer, elk, moose, bears, beavers, birds and numerous others. The forest lands also provide food for many animals. Deer, elk, and moose feed on shoots of young trees. Bears wander through the forests in search of berries and other vegetation. Therefore, the idea of forest conservation should be of great concern.

In addition to destruction of forests by careless lumbermen, forests may be destroyed by forest fires, insects, and animals such as beavers, rabbits, deer, etc. Unless this destruction can be stopped, our forests will soon completely disappear and their value as one of our natural resources will be gone forever.

Another of our natural resources is our wildlife. We are dependent upon many animals to supply us with

(Continued on page 21)

Pheasants do not become tame. They are a wild breed of bird, and even though they are raised in captivity they stay wild.



Pen-raised birds are certain to be young and tender. They are fed special high portein feeds to keep them vigorous and healthy.

In Operating a Shooting Preserve

OUR BUSINESS

By FRANCIS R. OMLOR*

THE business of operating a hunting preserve is a lot more fun than one might expect. Of course, it is a business with profits and losses dependent on success of operation. And there's a goodly share of hard work involved also. But it's still a lot of fun.

In the first place the work, for all practical purposes, is outdoors. In the second place one is meeting new people every day—men removed from desks, the rush of competition, and in a relaxed frame of mind. Our customers are sportsmen in the truest sense. They enjoy hunting. They enjoy the work of good dogs and clever, beautiful sporting birds. They enjoy tramping through brush and woods, the relaxation provided by a day outdoors. They enjoy a good lunch plus the opportunity to rehash the day's experiences following the hunt.

Yes, operating a hunting preserve is a business, but by actively participating in the operation, it can become loads of fun.

We'd like to relate a few of our experiences as we near the close of our first season, a closing necessitated by our inability to obtain more birds.

The pheasant makes an ideal game bird. It seeks cover, provides a challenge to a dog since it is a great runner. It flushes high and fast and the direction of its flight is absolutely unpredictable in addition to being fast.

Great pleasure is to be derived from observing a well trained dog striving to "pin" and hold at point a bird which prefers to run and then to prevent further movement until hunters arrive to flush. Or to see a bird drop into a stream of water, travel upstream a short way and leave it via the opposite bank in an effort to lose the dog.

Why, we've even seen pheasants, when hard pressed, actually submerge in water to their heads, from the ring up. Even then the dogs located and pointed their quarry.

Often, when birds are flushed and missed, to settle again, you'll find them, not out ahead of where they settled but just the reverse. They've landed, made an about face and run for cover back along the line of flight.

In one day we've seen three frightened birds seek refuge high in the branches of trees. Three cock birds were flushed, two at once, one afternoon and all were hit but none seriously. Winds were strong and from the northwest. All the birds, upon flushing, flew with the wind and into the pines on the southern hill of our grounds. When next we came up with our dog, "Lucky," there he was pointing into a forest of trees. We checked them but only casually and were ready to move on, but not "Lucky." He was steady on his point and not about to leave. So, we rechecked and there was our bird about 45 feet off the ground. It wasn't easy to drive Mr. Pheasant from his perch of security but finally we accomplished our task and the boys brought him down with a few more number sixes. The second ringneck was located, again by "Lucky," in another tree, but this

*The author and his wife, Helene, operate the Hof Game Bird Farm in Fairfax County, Oakton, Virginia.



Pheasant eggs are gathered daily, carefully marked, and placed in incubators for hatching next year's crop.



The birds are released in likely cover before the shoot starts, and are found over the entire hunting area.

IS PLEASURE

time only about 20 feet off the ground. Then later, a third one. You know, it was funny. For the balance of the hunt, wherever "Lucky" was, he'd stop every so often and check the upper branches before moving on. He still does it on occasion, but that's another oddity. . . . Only on rare occasions before or since have we located birds in trees.

Then there was the afternoon when "Lucky" held a ringneck to point, the party moved in, flushed and shot, and the dog moved out and retrieved. On his return with the ringneck he suddenly froze on point again. As the party moved in, another cock bird, flushed, screaming its defiance to one and all. Shots rang out and Mr. Pheasant was dropped but only wounded, so he took off on the run. "Lucky" trailed him for over 100 yards into the woods and when next we came upon him, there he stood at point to the second bird but still holding the first bird between his jaws.

No kidding, these experiences are true and they only represent hundreds of interesting and delightful treats.

There was another morning when we encountered and flushed eight pheasants at one time. Guns were being fired all over the place. Four were taken on the first flush and others were picked up as singles later.

Then there was the hunter who singly knocked down two out of a three bird rise, then moved on to pick up the third later. And the party which hunted all day and never did shoot enough birds to reach the minimum. They admitted they weren't much as expert marksmen but they had a wonderful time.

It's all fun. Our business is fun. Hunting is fun. Were it different there would be no reason for hunting preserves.

A perfectly natural attitude for hunting enthusiasts to adopt toward a privately operated hunting preserve is one of doubt and skepticism. Pay for hunting! Preserve hunting can't be natural — tame birds provide no sport! Birds are planted and hunting is too simple.

Well, we try to operate the Hof Game Bird Farm differently. In the first place, both Helene and I enjoy people. We enjoy their company and are happiest when others are pleased.

(Continued on page 23)

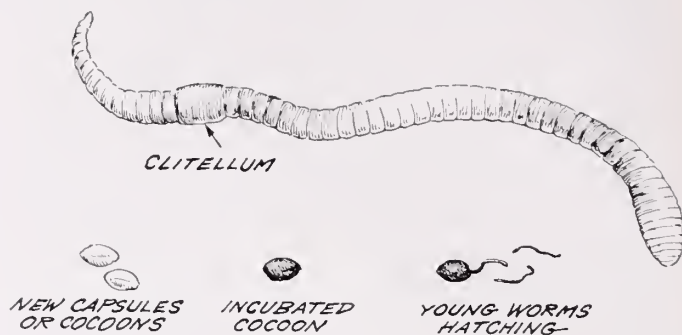
Interesting and useful by-products of the shoot include feather covered hats, pocketbooks and other decorations.



WHAT VALUE EARTHWORMS?

By

MARY MARSHALL DOYLE*



The earthworm, commonly known as "nightcrawler," "rainworm," "angleworm," or "fishworm," is found in some form all over the globe except in extremely dry climates.

THE earthworm, more commonly known as "nightcrawler," "rainworm," "angleworm," "fishworm," etc., is found in some form practically all over the globe—except in extremely dry climates. This simple animal is of far greater value to mankind than most people realize. Indeed, the earthworm's life is dedicated to aiding mankind—in his work, in his pleasures and in his very existence. The earthworm's body is a machine which is constantly producing humus and rebuilding the earth which man is constantly tearing down by abuse.

Earthworms are nocturnal animals that live in underground burrows, which form a network of tunnels going six feet or deeper into the ground. These burrows, or tunnels, allow water to penetrate into the soil, lessening run-off water which causes erosion. The burrows also allow air to circulate throughout the soil, and the downward growth of roots is aided by them.

The most important function of the earthworm is fertilization of the soil. Earthworms feed on the organic matter they find in the soil and on its surface. They do not feed on living plants, but fallen leaves and other materials are pulled down into the burrows for food. These are only partially eaten and their remains are thoroughly mixed with the worms' castings, thus adding organic matter to the soil. As the soil and other foods are digested and pass through the earthworm's body a chemical change takes place; the secretions of the earthworm's digestive organs are responsible for this change. When the same soil is deposited as castings on the surface near the entrance of the burrow it is rich humus. The very texture of the soil has been changed, it has been ground and processed, so that now it has become one of the best known fertilizers. It is also a very economical fertilizer; for if earthworms are allowed to work in the soil they are continually and endlessly supplying this fertilizer which is rich and dark in color—and excellent for growing plants.

"The Experimental Study of Earthworms" was the

*Exhibitor, Virginia Junior Academy of Science, Richmond, Va., May 9-11, 1956.

title of my Science Fair project this year; and one phase of my work and experimentation was the effects of worms on the soil. I took from the back of our garden in Roanoke a quantity of dirt which could be called typical Virginia red clay; it is very poor soil and almost nothing will grow in it. Taking another quantity of the same soil, I put into it about a dozen large nightcrawlers and allowed them to work in it for eight months. There was then a notable difference in the color and texture of the two soils. The container that had the earthworms was much darker because of the humus castings deposited by them. To prove this soil was superior and would produce superior crops, I planted pea seeds in both soils. The results were amazing. Although the seeds were planted at exactly the same time, the ones in the original (non-earthworm) soil took far longer to penetrate the surface. The peas planted in the earth the worms had worked broke the surface sooner and far more easily because of the finer-textured soil which did not crust, as did the original clay. These plants were cared for in identical manner, but the ones in the improved soil grew much faster—and bloomed before the others had even set the buds. I repeated this experiment and had again the same result; thus proving that earthworms are of inestimable agricultural value.

Surprisingly large quantities of these rich castings are constantly being deposited. An earthworm can deposit its body weight in the form of castings in twenty-four hours! It has been estimated that they can deposit as much as eighteen tons per acre per year; or, spread evenly, approximately two inches in ten years.

As every fisherman knows, earthworms are a good bait. One variety, known as the California Redworm, is a favorite because of its red color and the fact that it will continue to wriggle for a long time on the hook.

Worms can be raised in backyards; or great numbers can be gathered at night—specially after a rain. However, worms are difficult to pull from their burrows because of the four pairs of tiny bristles on each segment

of their bodies. These are used to anchor the posterior end securely in the burrow while the anterior stretches forth in search of food.

Earthworms will not drown, as many people believe, for they can live for months submerged in water. But they will die if dried out. Earthworms breathe through their skins which must always be kept moist. Mucous glands keep the skin moist by their secretions. The reason earthworms come to the surface during and after a rain is because their burrows have become filled with water which has filtered through the soil and contains little oxygen. Thus they are forced to come to the surface where light will injure them. Puddles probably offer a slight protection. Many of the dead ones found after a rain were probably sick before, and the rain only speeded their death.

The worm native to this region is a large species, commonly known as "the nightcrawler." This worm is easily cultured, for it will thrive in almost any moist soil in which it can find sufficient food. The best way to encourage earthworms is to furnish them with a good food supply, for the number of worms in a given location is solely determined by this factor. However, they are easily pleased as to diet. They will feed on most products man has used—home and farm waste and dead vegetable materials. Manure and compost piles are excellent. The soil itself, with its invisible algae, fungi, and moulds, becomes earthworm food. *But do not use chemical fertilizers, for they will kill or drive away the worms.* Organic fertilizer encourages them.

Indoor cultures may be boxes, cans, or designed beds; but the important thing to remember is that they must be kept moist and shaded. The worms must be fed, and the containers must have holes in the bottom. The worms will do better if the soil has no stones. The compost in the containers should be a mixture of manures, loam, peat moss, and some corn meal or chicken mash for food. In large beds leaves, straw and hay and similar materials may be used instead of peat.

Worms multiply readily, as each worm is both male and female (hemaphrodite), so any other worm will serve as a mate with which it can exchange sperm. Then the clitellum secretes a mucous ring which slides forward over the worm's body, receiving eggs and sperms as it passes the genital openings. When the ring slips over the head, it closes and becomes a cocoon, which will hatch in about two or three weeks. The number of worms in a nightcrawler's cocoon varies from four to twenty young of needle size. These cocoons, under favorable conditions, are reproduced every seven to ten days. Thus it can be seen how quickly the worms will grow and multiply, and how little care is necessary. All that is required is that the temperature be kept moderate; for if it is too cold the worms will place a casting in the entrance of their burrow and go far down into the soil, where they hibernate in colonies until the soil is again the correct temperature.

Lowly though he may be, the earthworm certainly is very important and very beneficial. The presence of this underground neighbor will improve any land—from flower beds to fields. His prime purpose seems to be that of serving and benefiting man!

HELP WILDIFE (Continued from page 17)

food, for clothing, and for use in industries. Man, seeing animals mainly as a source of income, has neglected to give them any protection. In addition to being destroyed by man, animals are destroyed by forest fires, polluted water supply, and because of lack of food. Each person, regardless of age or sex, should take part in the conservation program to help protect our wildlife.

Through studies made by the United States Fish and Wildlife Service on food habits, diseases, and habits of wildlife, control measures have been established. These include: 1) Passing laws requiring open and closed seasons for hunting and fishing; 2) Establishing wildlife refuges; 3) Making treaties with other countries to protect migratory birds and animals; 4) Making regulations about the size or age of the animal caught, the number to be taken, and the time of day for hunting; 5) Restocking of streams with fish or land with animals; 6) Encouraging fur and game farming; 7) Growing shrubs for ground cover and for food supply and 8) Cooperating with such services as the Soil Conservation and Forest Service.

With the knowledge that I have received in my studies in agriculture in high school, I can put to work this vital information. I have had many opportunities to speak to different organizations on our necessity of maintaining wildlife, and some of these organizations have sponsored wildlife management programs. It is organizations like these that are trying to teach people the urgent need of protecting and saving our wildlife.

The work of conservation is still going on, but it needs the understanding, support, and help of each person in the country. It is the responsibility of all and for our future.



A number of controlled experiments prove the value of earthworms as a soil and land conditioner from flower beds to farm lands. Note difference in plant growth. Pot A contains soil not worked by earthworms; that in pot B was.

SNAKES and SNAKE VENOM

By ERNEST A. TAYLOR*

THERE are only four kinds of poisonous snakes in eastern United States: the rattlesnake, cottonmouth moccasin, copperhead—all pit vipers—and the coral snake. There are several species of rattlesnakes such as the diamondback, pigmy, canebrake, massaugua and timber. There are three subspecies of copperheads, and one species of water moccasin. The coral snake is in a different family altogether, known as elapid snakes, of which there are three subspecies in eastern United States. Of these poisonous snakes, Virginia has only the timber rattlesnake, the northern and southern forms of the copperhead and the cottonmouth moccasin.

The venom of each species of poisonous snake varies in potency as does also the volume of venom carried by each snake. The venom of the rattlesnake, moccasin and copperhead is said to be haematotoxic, in that it attacks the blood stream. The venom of the coral snake is neurotoxic and attacks the sympathetic centers of the nervous system.

Haematotoxic venom is more broadly distributed and Wyeth Inc. of Philadelphia says, "... it produces thrombosis, extensive neurosis and gangrene, poisoning of the voluntary muscles, weakening of the heart action and depression of the vasomotor center."

Of the four poisonous snakes, the coral snake is the most dangerous. It is related to the cobra of India. Its venom is said to be neurotoxic and can cause respiratory failure which may be preceded by headache, muscular weakness, lethargy and difficulty in speech with accom-

panying facial paralysis.

E. Ross Allen, who manages the Reptile Institute of Florida at Silver Springs, an establishment which is nationally known for its collection of snakes both poisonous and non-poisonous, as well as for its scientific developments with the poisonous snakes, has done a great deal of research on snakes. His institute is unequalled, and its findings include methods of preparation of venom used in the treatment of medical and mental illnesses throughout the country. The Reptile Institute says, "We supply well known laboratories with venom for making antitoxin, serums for hemorrhagic conditions, rheumatoid arthritis, epilepsy and relief of pain in cancer." They also say, "We are proud of our record of supplying 90% of the venoms used by our armed forces of World War II; this included 27 different varieties from a total of 73,000 snakes."

"Venom from adult reptiles is a yellow viscid liquid which looks somewhat like orange juice and dries into pale yellow crystals," says Mr. Allen. "The venom from juvenile specimens is almost colorless and of a much thinner consistency. Such clear venom may be found in rattlesnakes 3 feet in length, and it has been found that this type of venom is far more potent than that of the adult snake. It must be processed immediately because snake venom oxidizes rapidly and loses its potency if exposed to air for any length of time. Therefore it is immediately put through a dehydrating process that reduces the liquid to a semi-crystalline substance, or it is placed in a preservative without dehydration."

When you take into consideration the large number



Copperhead



Rattlesnake



National Audubon Society Photos
Cottonmouth

*Field technician for Hillsborough County Herpetological Society, Tampa, Florida, and former engineer with the Virginia Department of Highways.

of people who take to the fields, woods and streams to hunt and fish, the percentage of snake bite victims is small. The number of deaths occurring from these bites is also small. This is probably due to the public's ever-increasing knowledge about first aid treatment for the victims of poisonous snake bite.

Although it is undeniably dangerous, the poisonous snake certainly does have a very valuable place in man's economy. Not only does it provide valuable serums, but its life habits reveal that its food consists of rodents and insects which are destructive to man. Also its meat is processed for food, and its skin is processed for making belts, hand bags, shoes and other goods. And its vertebrae is used as trinkets.

The venom of snakes, when used in commercial laboratories such as Wyeth Inc. of Philadelphia, is processed with the blood from test horses. The end product is antivenin. Wyeth says, "It is the safest method in the treatment of poisonous snake bite and has reduced mortality in patients without other specific treatment to less than 20%."

Wyeth further states, "Snake venom is a complex

agent containing a large number of toxic (poisonous) components, some of which act locally on the tissues around the wound and others on the vital organs after absorption. . . . The amount and virulence of the venom injected varies with the species and size of the snake. The poison sacs of all rattlesnakes are believed to contain enough venom to kill a man, but it is extremely unusual for any snake to empty the glands at one ejection. Some may expel only a fraction of a drop; but the larger snakes, such as the diamondback, may introduce 1 to 2 cubic centimeters. The venom of *Sistrurus*, however, is particularly powerful and is considered of higher toxicity than the poison of some of the larger species. The *Sistrurus* is the pigmy, or ground, rattler.

Virginia's poisonous snakes are found mostly in the higher elevations and those who hunt and fish in the hills should be wary. They should always take with them a first aid kit containing a snake bite kit. There are some hunters and fishermen who always do have antivenin with them because it has the highest value for immediate application after a victim has been struck by a poisonous snake.

OUR BUSINESS IS PLEASURE (Continued from page 19)

Actually, pheasant hunting on a preserve isn't very expensive when one considers that he will actually be taking home birds at the conclusion of the hunt. There is none of this hunting a whole day and getting nothing in the way of game. Then too they've hunted with trained dogs. They've hunted in fields, in brush, in woods and the hunt was never a cut and dried affair. The birds were found over the entire hunting area and under naturally wild hunting conditions. Our birds are not planted. We flush some directly from the pens which are scattered all around the grounds. We usually lose a bird or two which fly off the hunting area, but we feel it is worth it since it does get the birds out more naturally. Other birds are taken to the fields and brush areas in bags and turned loose. Earlier in the season we merely placed the open bags of birds in heavy cover and permitted them to leave and find shelter on their own but on occasion there would be a bird which remained in the bag and that is not good hunting, so now we empty the bags and it is up to the dogs and hunters to locate them.

Pheasants do not become tame. They are a wild breed of bird and remain just that. The only difference between the birds shot at in a preserve and those which have been hunted in native lands is in the character of the meat. Pen-raised birds are certain to be young and tender while birds native to the area might be any age from one to perhaps even 15 years and therefore cannot possibly be as tender. So too pen-raised birds are fed special high protein feeds which aid in the production of tender, juicy flesh. All birds for hunting at our pre-

serve have been raised in large exercise pens where they can and do fly at will.

Indeed we do operate a business but we like to believe our business is pleasure — the hunters' pleasure. We want them to leave with a smile and we want them to return. There's only one way to insure that and you know the answer.

Then too, Helene and I enjoy good food and its preparation. As a matter of fact, she's a whiz in the kitchen. She serves lunches, on the house of course, at the end of each hunt. I'll wager there aren't many better experiences than to return from a hunt on a cold day and upon opening the kitchen door to be met by the aroma of home-baked bread or rolls. That's Helene at work. She serves all homemade breads, rolls, pastries, baked beans, scrapple, soups, roasts and smoked treats.

Yes, indeed, pleasure is our business.

Another experience which might interest you is the number of fathers who bring young sons to hunt. The care they take in demonstrating the proper method for carrying and handling guns, the patience displayed in teaching the hunters of the next generation how best to enjoy a hunt is most interesting. Some of them have done some beautiful shooting, too, even to the point of out-shooting Dad on this particular day.

You should see the hunters who drive down our lane on Sundays accompanied by wives and children who want to see where Daddy hunted and all the birds which are still in the pens.

Operating this preserve for one short season has stimulated our faith in man, family and the American way of life.



Bird Banding Reveals New Data

Although the reports on the almost 7,000,000 birds which have been banded in the last 50 years under the supervision of the Canadian Wildlife Service and the U. S. Fish and Wildlife Service usually reveal a large general pattern of movement, there have been several notable diversions.

For example, one pintail duck banded in California was shot three months later on an island in the Pacific, 4,500 miles away. Another pintail duck banded in North Dakota was killed in South America. Still another was downed in England only 21 days after being trapped and banded in Labrador.

The long-distance champion of all is the Arctic tern whose annual round-trip migration extends from the Arctic to the Antarctic, a distance of 25,000 miles. Several terns that were banded in North America have turned up later in France, Scotland and even in northern and southern Africa.

Many of these banded birds are never reported upon; possibly because the bands were not noticed by the hunters who shot them or because the birds perished in thickets and were never found. Each band is stamped with a number and instructions to notify the Fish and Wildlife Service, Washington 25, D. C. The band, the date of taking, and the name of the nearest town should be sent in.

Trumpeter Swans Have New Nesting Sites

The U. S. Department of the Interior announces the finding of a new nesting ground of the trumpeter swan near the mouth of the Copper River in Alaska. Down now to a population of slightly more than 500, this unusually beautiful bird has long been threatened with extinction. This new discovery extends the known range of the bird farther north and west than was previously estimated.

Nelson Cox New Arkansas Game Director

By a unanimous vote of the Arkansas Game and Fish Commission Nelson Cox has been appointed its new director. A former school teacher, member of the House of Representatives and Highway Department Purchasing Agent, Mr. Cox has been since 1953 Assistant Director and Public Relations Officer.



Salt Water Fish in Fresh Water

Exciting experiments are now taking place in Texas to see if two popular game fish, the redfish (*Sciaenops ocellata*) sometimes called channel bass and the spotted sea trout, (*Cynoscion nebulosus*) also called spotted weakfish, can be established in inland lakes.

It has been found that not only will many saltwater fish live in fresh water, but that oftentimes some will grow faster and larger when transplanted. The Texas Game Commission is carrying on these experiments in Lake Kemp, an artificial lake near Wichita Falls containing approximately 560,000 acres of water.

Whooping Cranes Reported

Twenty-three of the estimated twenty-seven whooping cranes still in existence had been sighted by May 16th of this year, after having left their wintering grounds on the Arkansas National Wildlife Refuge in Texas sometime between March 23 and April 6. Three were spotted by a Fish and Wildlife Service pilot-biologist who declared that one was occupying a nest found last year. The Canadian Wildlife Service reported the other twenty whoopers which were seen not far from Winnipeg, flying low and making good headway against a 30-mile-an-hour wind.

The location of the breeding grounds was unknown until last year when field biologists of the Fish and Wildlife Service, the Canadian Wildlife Service and the National Audubon Society finally located breeding cranes in the wilderness of the Wood Buffalo Park Great Slave Lake area of Canada.

Last year eight new cranes were born in the Canadian nesting grounds, the largest number of progeny noted since the first official count was made in 1938-1939. In 1941-1942 there were 15 whooping cranes; and in 1949-1950 there were 34.

Strictly for the Birds

A half million dollars has just been appropriated by Ducks Unlimited to continue the work of restoring and rebuilding duck breeding grounds in the Canadian Prairie Provinces in 1956. It is on the breeding grounds of Canada that more than 65% of this continent's migratory waterfowl raise their young. Since western Canada is growing and developing by leaps and bounds, there is danger of the ducks' domain being encroached upon and their survival seriously threatened, something which duckhunters would certainly not like to see happen.

Legends About Trees

Many of the trees which now shade us or give us fruit have been serving mankind in like manner since ancient times; and many stories and legends concerning trees have passed down from generation to generation. You could achieve immortality by eating an apple, according to the Persians; and, similarly the ancient Norwegians believed that eating an apple would keep you young. The juniper tree was perhaps even more beneficial—it kept witches away from your home. Before entering the door the witches had to first count the leaves of the juniper sprig over the doorway; but the juniper's profuse leaves were too much for them and they always gave up in disgust and went away.

Even today we think of the oak tree as a symbol of strength, the armed forces using a conventionalized oak leaf for the insignia of a major. In olden times it was thought of as the tree belonging to the god of thunder, and was so highly regarded in Saxony that a law was passed forbidding its injury.

More Fish Are Marked

The Oregon Fish Commission and the Washington Department of Fisheries are now marking steelheads with yellow plastic streamer tags threaded through the fish's dorsal fin. When found by fisherman these tags are to be returned. The purpose is to determine the size of the run, the time before being caught and the method of recovery.

Movie Bad Man Now Good Conservationist

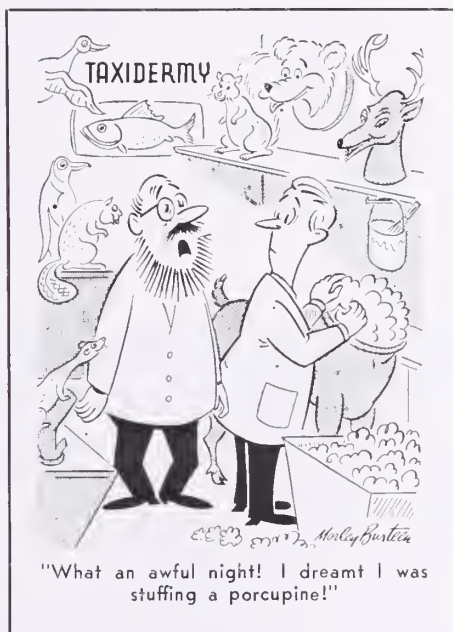
Jimmy Cagney, professional tough guy of Hollywood, has recently (probably partly because he is the owner of a 100 acre dairy farm in Dutchess County, N. Y.) become one of conservation's staunchest supporters. For years he has been a member of a conservation group known as The Friends of the Land, and is particularly interested in and concerned with the conservation of soil.

Although Mr. Cagney was born and brought up in New York, when he was a child he used to frequently visit his aunt's farm in Flatbush and he has

been interested in the outdoors ever since. In fact, when he was a teenager he wanted to be a forester, and only went into show business because he badly needed a job.

Arkansas' McAmis Dies

The outdoor world has suffered a loss in the death of Thomas Arthur McAmis, for the past fifteen years the director of the Arkansas Game and Fish Commission. It was he who guided the state's new non-political commission through its formative years; and the nationally outstanding quality of its game management work was also largely due to his influence.



Wild Pet Book

In circulation for several months now has been *The Book of Wild Pets* by Clifford B. Moore, well known zoologist and director of Forest Park Museum in Springfield, Massachusetts. It is a detailed yet simply written publication covering many aspects of "the care, feeding and habits of fish, reptiles, insects, small animals and birds in captivity."

One hundred twenty-eight sketches and 214 black and white photographs illustrate clearly the message of the text. Technical matter of interest to both layman and teacher is set down in vivid fashion by one whose knowledge of these creatures comes from first-hand experience.

Charles T. Branford Company of Boston is publisher of the work.

Essay Contest Winner Wins Again

A Rollins Fork youngster who won top honors in the statewide wildlife essay contest two years ago this year has been awarded the duPont Regional Scholarship to the University of Virginia. The promising student is Edward Casper who when he was a sophomore at Oak Grove High school won the \$50 grand prize awarded by the Commission of Game and Inland Fisheries and the Virginia Izaak Walton League to the 10th grade writer of the best essay in their annual contest.

Fishing and Religion Can Mix!

Ardent fishermen in Michigan can fish on Sunday and feel virtuous while doing so—because their minister will be right there with them. On the theory that a minister should "unbend" and that religion should be a "living experience," Reverend Glenn Groth of Bethlehem Luthern Church is taking the fishermen of his congregation on what he calls a "fisherama." Besides fishing (for perch) there will be a sermon stressing Christ's personal and vital appeal to his disciples, "Come unto Me and I will make you fishers of men."

"I know there will be criticism," Reverend Groth says, "but I can find nothing wrong with a church or its appointed ministers unbending to make religion a living, personal experience."

Anybody Can Be a Tree Farmer

The landowners whose properties make up the Virginia Tree Farm Program are a diversified group consisting of members from all walks of life. Out of three new tree farmers, for instance, one was a doctor, one a widow and one a farmer. These new tree farms bring the state's total up to 696,939 acres of well-managed forest land.

In Virginia the program is sponsored jointly by the Virginia Committee of American Forest Products Industries and Virginia Forests Inc., the Virginia Division of Forestry, the V.P.I. Extension Service and the Soil Conservation Service. These agencies define a tree farm as "a privately-owned tax-paying forest dedicated to the continuing growth of forest crops for commercial purposes."



Get Your New Fishing Law Digest Now

I. T. Quinn, executive director of the Commission of Game and Inland Fisheries, wishes to call the attention of *Virginia Wildlife* readers to the fact that the fishing law digest is out now and in full supply. Copies can be had for the asking wherever fishing or hunting licenses are sold, from all county agents, from all game wardens and directly from the Commission's offices, 7 North Second Street, Richmond.

The changes in the new law digest which are of special interest to fishermen are: 1) it is unlawful to fish for trout with more than one hook attached to a single line in streams stocked with trout (this does not prohibit, however, the use of artificial lures with more than one hook); and 2) Shenandoah National Park is opened to trout fishing this year, but only with the use of artificial lures.

New Club in Mecklenburg County

The Buggs Island Fish and Wildlife Organization was formed in Boydton, Virginia, on March 9th of this year to establish and maintain improved boating, swimming and fishing facilities in Mecklenburg County. Additional purposes of this new club are: to encourage the enactment and enforcement of proper fish and game laws; to stimulate interest in fishing, boating, swimming and hunting, to promote sound conservation practices in restoring fish and upland game to the county; to foster sportsmanship; and to perform all such general and specific acts as may be necessary, reasonable and proper in carrying out the aims of the club.

When the group was formed its first officers were elected. Mr. S. H. Short, Jr. is the president; Mr. C. W. Carr is vice-president; and Mr. M. R. Lynn, Jr. is secretary-treasurer.

Operation Black Bear

A project to determine accurate growth and weight measurements of black bears is now under way at the Virginia Cooperative Wildlife Research Unit at V. P. I. in Blacksburg. A. R. Stickley, a graduate student, is conducting the study with three young bears, two males and one female.

In the picture Webster Richardson, V. P. I. professor of physics, is assisting Stickley by taking an X-ray of the skull of one of the bears in order to record the development of teeth and cranial structure. To make him lie still for the X-ray, the bear was given nembutal.



A. R. Stickley (left) and Webster Richardson X-raying an anesthetized black bear cub in the physics laboratory at V. P. I.

Virginia Commission Using Wild Turkey Stamps

Several thousand new wildlife stamps have been ordered and received by the Commission of Game and Inland Fisheries for use on all its outgoing mail. The wild turkey stamp was released May 5 at Fond du Lac, Wisconsin, and will be followed by two more wildlife stamps, one depicting a salmon and the other an antelope.

Sportsmen, nature students, garden club members and all other interested people can help the cause of conservation, at least in a small way, by making heavy use of these pioneer issues.

New Educational Bulletin Scheduled

A new special publication titled *Game Animals and Furbearers in Virginia* is now being prepared by Chester F. Phelps, chief of the game division of the Commission of Game and Inland Fisheries, and J. J. Shomon, chief of the education division. It will be a 4-color booklet similar to the two previously published and very well received 25 cent booklets, *Birdlife in Virginia* and *Fishlife in Virginia*. Included in the booklet will be color reproductions of each of the state's game animals and furbearers painted by Ed Bierly, a noted wildlife artist and the winner of the 1956-1957 "duck stamp" contest.

Another project of the education division upon which work has already been begun is a film about the James River and the resources of its watershed. It is being shot in color by L. G. Kesteloo, the commission's staff photographer, and is expected to take at least two years before completion.

Safe Boats Essential

Being sure that your boat is in good condition and water-tight is just as important as being sure that no one who cannot swim is allowed in your boat, says Webb Midyette, chief of the law enforcement division of the Commission of Game and Inland Fisheries. The recent Gloucester County tragedy in which three fishermen were drowned probably would not have happened, he says, if they had taken the precaution of checking their boat before going out in it.

In a warning to the general public and particularly fishermen he points out that a similar catastrophe is not likely to happen in state-controlled ponds because all the agents and concessionaires who rent out boats are required by the Commission to keep them ship-shape.

Wildlife Questions and Answers

Ques.: I am interested in the southern fence swift (*Sceloporus u. undulatus*) especially its food and breeding habits. I would appreciate any information you might have on this interesting lizard.

Ans.: Most lizards are carnivorous; a few are herbivorous or omnivorous. The majority are insectivorous including the southern fence swift that you are interested in. Food habit studies show that they eat moths, butterflies, grasshoppers, spiders, ants, wasps, millipeds, snails—including most insects. The southern fence lizard in its southern range breeds the spring following hatching. They are egg layers, and usually deposit their eggs under the decaying wood of a rotting log, stump or under the loose bark of some dead tree. These eggs are soft shelled and about the size of an average pencil eraser. They are shaped very much like the eggs of chickens.

Ques.: Recently in a talk by a game biologist from the Virginia Commission of Game and Inland Fisheries the phrase "homing instinct" was used. Just what is it?

Ans.: According to William Rowan in "The Riddle of Migration," homing is returning to a place already familiar. Some birds and animals possess this instinct and will return to the place of their birth to raise their young.

Ques.: Why do many party-boat skippers discourage the use of light tackle for salt water fishing?

Ans.: Usually because they're accustomed to having meat hunters aboard, says Shad Sheperd in *The Fisherman*, and nothing riles a meat hunter more than another angler who makes a sport of his fishing. Fortunately, the meat hunters are not in the majority. Friction is fairly easy to avoid simply by fishing off the prow and leaving the favored stern positions to those who want them. Your chances at the prow are usually just as good anyway.

Ques.: How many guns is it legal to hunt with at one time? For example, is it legal to hunt with two guns, a rifle and a shotgun, at the same time?

Ans.: There is no restriction as to the number of legal guns with which one may hunt. The important thing is to practice sensible gun safety.

Ques.: Lately the word "anadromous," describing certain species of fish, has appeared in several fishing articles. Just what does this word denote?

Ans.: An anadromous fish is one that spends some of its life in salt water but returns to fresh water for spawning. In Virginia waters the rockfish, American shad and hickory shad are good examples.

Ques.: Is there a closed season in Virginia for hunting the groundhog or woodchuck?

Ans.: The groundhog is not classified as a game animal and may be hunted at any time, except on Sunday, on your own premises. With written permission from the landowner and a hunting license, it may be hunted on other people's property.



Ques.: We have recently moved to the country, and my neighbor says that the tadpoles we see along the edges of our new farm pool will develop into frogs. Is this possible?

Ans.: Your neighbor is quite right. In their development frogs and toads pass through an aquatic larval stage known as the tadpole which is provided with gills for extracting and utilizing oxygen from water. The tadpole undergoes a marked metamorphosis (change in form) losing the gills and developing lungs which enable it to breathe dry air and to emerge from its aquatic habitat for life on land.

Ques.: Can you tell me the origin of the expression "hook, line, and sinker"?

Ans.: Mr. Webb Garrison, writing for *The Fisherman Magazine* gives his version of the beginning of the expression. According to Mr. Garrison, it is likely that fishermen of ancient times had devices to weight their hooks. Our American Indians shaped special stones, hand-rounded with great labor, for such use which admiring pioneer woodsmen and explorers called sinkers.

Those pioneer times were also an era of tall tales and legends. Sometimes when a tenderfoot from the East "bit" on a frontier yarn, he was compared with a hungry fish and said to swallow the story "hook, line, and sinker." By 1844, the colorful American phrase had reached England and was being used on both sides of the Atlantic to describe gullible, uncritical listening.

Ques.: In our farm pond there are several kinds of turtles. They dive under the water and stay for long periods of time. Can they breathe under water?

Ans.: When a turtle dives under water it ceases to breathe, and holds its breath until it reaches the surface again. Sometimes they will come up under a bank or other hiding place; but they must have oxygen regularly.

Ques.: I've often seen bats flying around in the late afternoon and early summer evenings and wondered how they rest when not in flight?

Ans.: The bat's wing is equipped with a hook in the form of a claw. This enables it to cling to walls, rocks, etc. From this clinging position the bat takes flight. Without the hook on its wings, it would be one of the most helpless of all animals.

Ques.: I have noticed that the tracks of deer look very much like the tracks of sheep on our farm; are these animals alike in other ways?

Ans.: Our deer belong to the group of animals called Pecora, which includes the true ruminants or cud chewers with four-chambered stomachs. Other members of this group are the giraffe, antelope, cow, goat and sheep.

Ques.: I have heard that several eels were taken from a small lake in the Amherst region. It is possible that they were the freshwater eel?

Ans.: The American or freshwater eel (*Anguilla bostoniensis*) is found statewide in Virginia, and it is quite possible to find them in lakes or other waters of the Amherst region.

FISH FOR FUN!

Stocking man-made farm ponds makes new fishing water we haven't had before.

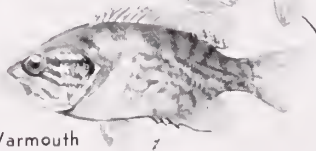
TRY THE PANFISH



Crappie

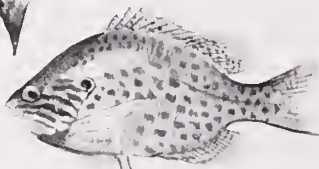


Bluegill



Warmouth

Sunfish

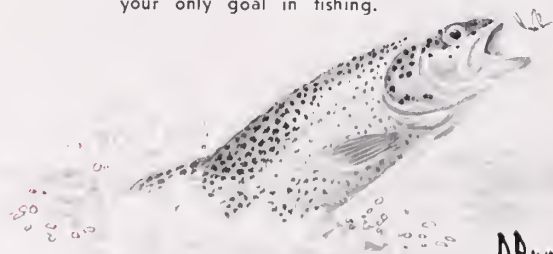


Rockbass



Enjoy all of nature when you fish.

Don't make catching meat your only goal in fishing.



DRAVER



When you go fishing take a boy with you!